

Cells and Heredity

7-2 The student will demonstrate an understanding of the structure and function of cells, cellular respiration, and heredity. (Life Science)

7.2.3 Compare the body shapes of bacteria (spiral, coccus, and bacillus) and the body structures that protists (euglena, paramecium, amoeba) use for food gathering and locomotion.

Taxonomy level: 2.6-B Understand Conceptual Knowledge

Previous/Future knowledge: In 5th grade (5-2.4), students identified the roles of organisms in an ecosystem (including microorganisms and bacteria). In 6th grade (6-2.1), students recognized the structure of classification (including the five kingdoms).

It is essential for students to know bacteria by their shape and protists (euglena, paramecium, amoeba), by the way they move and gather food.

Bacteria are organisms that are classified into the Moneran Kingdom. They are all single-celled organisms. They are classified by their body shapes.

Spiral Spiral-shaped bacteria are corkscrew shaped

Bacillus Rod-shaped bacteria

Coccus Round-shaped bacteria

Protists are organisms that are classified into the Kingdom Protista. Although there is a lot of variety within the protists, they do share some common characteristics. Protists are usually one-celled organisms that live in all moist environments. They vary in the way they obtain food and move. Examples of protists include euglena, paramecium, and amoeba.

Euglena—Protist with Flagella

- These protists move pulling themselves with long whip like structure called *flagella*.
- These protists can have one or more flagella that help them move.
- The euglena is unique in that it has characteristics of both a plant and an animal, it contains chloroplasts that photosynthesize and also can consume other organisms as well.

Paramecium—Protist with Cilia

- These protists move by beating tiny hair-like structures called *cilia*.
- The cilia act as tiny oars that allow the protist to move through its watery environment.
- The cilia also move and help to capture food directing in toward a groove that functions like a mouth.

Amoeba—Protist with Pseudopods

- These protists move by extending their bodies forward and then pulling the rest of their bodies forward as well.
- The finger-like structures that they project forward are called *pseudopods* (false foot).
- The pseudopods are also used to trap food.

Cells and Heredity

7-2 The student will demonstrate an understanding of the structure and function of cells, cellular respiration, and heredity. (Life Science)

It is not essential for students to know other types of protists or other characteristics of bacteria.

Assessment Guidelines:

The objective of this indicator is to *compare* the body shapes of bacteria; therefore, the primary focus of assessment should be to detect differences among the shapes of bacteria (spiral, coccus, and bacillus). However, appropriate assessments should also require students to *classify* a bacterial cell as spiral, coccus, or bacillus.

Another objective of this indicator is to *compare* the body structures of protists used for food gathering and locomotion; therefore, the primary focus of assessment should be to detect similarities and differences among the structures of protists (euglena, paramecium, and amoeba) used for food obtainment and locomotion. However, appropriate assessments should also require students to *identify* a protist as a euglena, amoeba, or paramecium based on its structures for food gathering or locomotion.

NOTE TO TEACHER: This may be a good place to introduce viruses. Even though viruses are only tested related to diseases (7-3.4), students will need basic knowledge of viruses.

- Viruses are tiny particles much smaller than bacteria and can only be seen with a very powerful microscope.
- In isolation, viruses show none of the expected signs of life. They do not respond to stimuli, they do not grow; they do not do any of the things we normally associate with life. Therefore, they should not be considered as living organisms at all.
- However, viruses do show one of the most important signs of life: the ability to reproduce.
- Viruses are considered to be nonliving until they infect the cells of a host plant or animal and reproduce within those cells.

Viruses are responsible for causing many diseases in living organisms (for example AIDS, colds, and flu in humans).